de Chile.' His last contribution embraces seven semi-mythical tales in the Pehuenche dialect, the original text and a Spanish translation. They offer much curious material, and often leave it doubtful whether the story is of native origin or borrowed from European sources. The first, for example, tells of a dead lover who came from his grave to claim his bride and carried her to his tomb. In spite of the striking similarity of this to the legend embodied in Bürger's ballad 'Lenore,' the editor believes it to have been from native sources.

Unfortunately, like so many other tribes, the Araucanians were little studied by the early settlers, and the knowledge we have of their mythology is vague and slight. Dr. Lenz very properly observes that it is all the more important to collect what still survives in their songs and stories; and, it may be added, the scholarly manner in which he presents his researches to the reader renders them models of work of this kind.

THE 14TH REPORT OF THE BUREAU OF ETHNOLOGY.

THIS report (for 1892–93) has just been distributed. It is in two parts or volumes counting up to over twelve hundred pages! The contributions are three in number, the first an exceedingly interesting paper by Mr. James Mooney on the ghost dances of our Western tribes; the second a study of the Menomini Indians, by Dr. Walter J. Hofman, containing a mass of accurate observations; and the third an erudite treatise on the expedition of Coronado to New Mexico in 1540, by Mr. George Parker Winship.

It is needless to dwell on the value of these contributions to the history and ethnography of our country. Every future student of these subjects will owe a debt to this and previous reports of the Bureau. No series of publications by our government has been edited with more conscientious care, and none can show a list of articles of a higher class, or of more permanent importance, than the Bureau of Ethnology. It should be a matter of patriotic pride, based on the recognition of solid merit, for the government to render liberal aid to this scientific department and increase the means of its usefulness.

D. G. BRINTON.
UNIVERSITY OF PENNSYLVANIA.

NOTES ON INORGANIC CHEMISTRY.

A LECTURE by Professor William Crookes on 'Diamonds' was delivered June 11, 1897, at the Royal Institution. It has been reprinted in the *Chemical News* and is perhaps the best brief treatise on the diamond ever written. The latter part of the lecture was devoted to the origin of the diamond as illustrated by the diamond 'pipes' of the Kimberley field. According to Professor Crookes the diamonds crystallized out of molten iron containing carbon in solution and at sufficient depth below the surface to give great pressure. Water finding its way down to this iron, the gas generated bored out the 'pipes' which were, "at the subsidence of the great rush, filled with a water-borne magma in which rocks, minerals, iron oxid, shale, petroleum and diamonds are churned together in a veritable witch's cauldron," a mud volcano. "It may be that each volcanic pipe"—of the South African fields—"is the vent for its own special laboratory—a laboratory buried at vastly greater depths than we have reached or are likely to reach—where the temperature is comparable with that of the electric furnace; where the pressure is fiercer than in our puny laboratories and the melting point higher; where no oxygen is present, and where masses of carbon-saturated iron have taken centuries, perhaps thousands of years, to cool to the solidifying point. Such

being the conditions, the wonder is, not that diamonds are found as big as one's fist, but that they are not found as big as one's head. The chemist arduously manufactures infinitesimal diamonds, valueless as ornamental gems; but Nature, with unlimited temperature, inconceivable pressure and gigantic material, to say nothing of measureless time, produces without stint the dazzling, radiant, beautiful crystals I am enabled to show you to-night."

Professor Mourelo, of Madrid, has investigated the preparation of a strongly phosphorescent strontium sulfid. The pure compound shows no phosphorescence, but the presence of a small quantity of alkali seems necessary, and a trace of subnitrate of bismuth is of advantage. When the mass which has been strongly heated is very slowly cooled, it shows after the action of even very little light, a strong phosphorescence. This property is lost on pulverization, but may be restored by long heating with starch.

In the *Zeitschrift für Angewandte Chemie* Th. Bokorny gives the results of a study of the antiseptic action of various substances. A culture medium of half per cent. egg albumen or peptone, with one-tenth per cent. potassium phosphate, two-tenths per cent. magnesium sulfate and a trace of calcium chlorid was infected with the bacteria of decay, and after addition of the substance to be tested, placed for several days in an incubator. Among inorganic compounds silver nitrate and mercuric chlorid have about the same value, 0.002 %, killing all organisms in two days. The antiseptic limit with silver nitrate is 0.0002 %; with mercuric chlorid 0.001 to 0.0002 %. Copper sulfate is nearly as active, 0.005 % killing all organisms in twenty-four hours, and 0.001 % preventing decomposition. Zinc sulfate 0.01 % kills infusoria in eighteen hours, but 0.1 % is not completely antiseptic, while cadmium sulfate toward algæ and infusoria is weaker than the zinc salt, but toward bateria stronger, 0.02 % being antiseptic. Lead acetate and nitrate in 0.1 % solution only delay decay, while it is prevented by the same strength of iron sulfate solution. The fluorids are not strong antiseptics, the limits being for hydrofluoric acid 0.02 %, barium fluorid 0.3 %, aluminum fluorid 0.1 %, calcium fluorid 0.03 %, ferric fluorid 0.06 %, magnesium fluorid 0.05 %. Ammonium fluorid 0.1 % is without action, but sodium fluorid 0.1 % is antiseptic; potassium fluorid is rather more active. J. L. H.

NOTES ON ENGINEERING.

A committee of the British Institution of Civil Engineers, appointed a year ago or more, have reported the following recommendations on steam engine efficiency, and they have been adopted by the Council:

(1) That the statement of the economy of a steam-engine in terms of pounds of feed-water per I.HP. per hour is undesirable.

(2) That for all purposes except those of a scientific nature it is desirable to state the economy of a steam-engine in terms of the thermal units required per I.HP. per hour (or per minute), and that if possible the thermal units required per brake HP. should also be given.

(3) That for scientific purposes the thermal units that would be required by a perfect steam-engine working under the same conditions as the actual engine should also be stated.

The proposed method of statement is applicable to engines using superheated steam as well as to those using saturated steam, and the objection to the use of pounds of feed-water, which contain more or less thermal units according to conditions, is obviated, while there is no more practical difficulty in obtaining the thermal units per I.HP. per hour than there is in arriving at the pounds of feed-water.

For scientific purposes the difference in the thermal units per I.HP. required by the perfect steam-engine and by the actual engine shows the loss due to imperfections in the actual engine.

A further great advantage of the proposal is that the ambiguous term 'efficiency' is not required.

In the contest which has now been so long